

REMARKS

In the last Office Action, claims 127-128 were rejected under 35 U.S.C. §102(b) as being anticipated by Brezoczky (EPA 0-549-236 A2). Claims 11, 12, 14, 101, 103, 104, 129 and 130 were rejected under 35 U.S.C. §103(a) as being unpatentable over Brezoczky. Claims 1-9, 13, 120-122 and 125 have been allowed, and claims 123, 124 and 126 have been indicated to be allowable if rewritten in independent form to incorporate the subject matter of the corresponding base claims.

Applicants and applicants' counsel note with appreciation the indication of allowable subject matter concerning claims 1-9, 13 and 120-126.

Applicants respectfully traverse the Section 102, 103 rejections of claims 11, 12, 14, 101, 103, 104 and 127-130, and request reconsideration of their application without further amendment to these claims as follows.

Brief Summary of the Invention

The present invention relates to a near-field optical head and to a method of manufacturing the near-field optical head.

As described in the specification (pgs. 1-7), conventional near-field optical heads have been unable to produce sufficient near-field light for recording information

to and reading-out information from a recording medium with high speed, accuracy and efficiency. Additionally, conventional near-field optical heads have a rather large and complicated structure, thereby rendering them difficult to operate.

The present invention overcomes the drawbacks of the conventional art. Figs. 6A-6B show a method of manufacturing a near-field optical head 500 shown in Fig. 5 and embodied in independent claim 11. A planar substrate 501 is provided having a first surface and a second surface opposite the first surface. An inverted conical or pyramidal hole 507 having a fine aperture at an apex thereof is formed through the first surface of the planar substrate 501 (S101). An optical waveguide 504 is formed on the second surface of the planar substrate for propagating light along an optical path (S102-104). A mirror 508 is formed in the optical waveguide 504 for bending in the direction of the fine aperture the optical path of the light propagated through the optical waveguide 504 (S105-S016).

In other examples embodied in independent claims 12 and 14, the optical waveguide 504 is bonded on the second surface of the planar substrate 501 for propagating light along an optical path.

By the foregoing construction of the near-field optical head and corresponding manufacturing method according to the present invention, the optical waveguide can be arranged close to the fine aperture. Additionally, the mirror and its location in the optical waveguide makes it possible to accurately focus the light propagated through the optical waveguide toward the fine aperture. Accordingly, the strength of light illuminated to the fine aperture and the intensity of near-field light produced from the fine aperture are increased as compared to the conventional art. Furthermore, the near-field optical head according to the present invention has high mechanical strength, a compact structure, and can be easily mass-produced.

Traversal of Prior Art Rejections

Rejections Under 35 U.S.C. §102(b)

Claims 127 and 128 were rejected under 35 U.S.C. §102(b) as being anticipated by Brezoczky. Applicants respectfully traverse this rejection and submit that independent claim 127 and dependent claim 128 recite subject matter which is not identically disclosed or described in Brezoczky.

Independent claim 127 is directed to a near-field optical head and requires a planar substrate having a first surface, a second surface disposed opposite to the first

surface, and an inverted conical or pyramidal hole extending through the first and second surfaces and having at least one fine aperture formed at an apex thereof and disposed in the first surface. Claim 127 further requires an optical waveguide for propagating light along an optical path, the optical waveguide being formed on the second surface of the planar substrate so that the optical waveguide and the planar substrate form an integral structure.

Thus claim 127 requires an optical waveguide for propagating light along an optical path, the optical waveguide being formed on the second surface of the planar substrate so that the optical waveguide and the planar substrate form an integral structure. No corresponding structure is disclosed or described by Brezoczky.

Brezoczky discloses an optical head comprising a planar substrate (i.e., slider) 31 (Fig. 3) or 51 (Figs. 4-5) having a conical hole 35 with a fine aperture 37 (col. 6, lines 1-22), and an optical waveguide (i.e., element denoted by reference numerals 46, 49, 61, 76 in Fig. 5) from which the planar substrate or slider is suspended by a flexure spring suspension 63 (col. 7, lines 43-53).

Thus in Brezoczky, the optical waveguide (i.e., element denoted by reference numerals 46, 49, 61, 76 in Fig. 5) is not "formed" on a surface of the planar substrate (i.e., slider 31 in Fig. 3 or 51 in Figs. 4-5), as recited in claim

127. Instead, in Brezoczky the optical waveguide is connected to the planar substrate via a flexure spring suspension.

In the absence of disclosing or describing a step of forming an optical waveguide on the second surface of a planar substrate, as recited in independent claim 127, anticipation cannot be found. See, e.g., W.L. Gore & Associates v. Garlock, Inc., 220 USPQ 303, 313 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984) ("Anticipation requires the disclosure in a single prior art reference of each element of the claim under consideration"); Continental Can Co. USA v. Monsanto Co., 20 USPQ2d 1746, 1748 (Fed. Cir. 1991) ("When more than one reference is required to establish unpatentability of the claimed invention anticipation under §102 can not be found."); Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co., 221 USPQ 481, 485 (Fed. Cir. 1984) (emphasis added) ("Anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim").

Stated otherwise, there must be no difference between the claimed invention and the reference disclosure, as viewed by a person of ordinary skill in the field of the invention. This standard is clearly not satisfied by Brezoczky for the reasons stated above. Furthermore, Brezoczky does not suggest the claimed subject matter and, therefore, would not have motivated one skilled in the art to

modify Brezoczky's near-field optical head to arrive at the claimed invention.

Claim 128 depends on and contains all of the limitations of independent claim 127 and, therefore, distinguishes from the prior art of record at least in the same manner as claim 128.

In view of the foregoing, applicants respectfully request that the rejection of claims 127 and 128 under 35 U.S.C. §102(b) as being anticipated by Brezoczky be withdrawn.

Rejection Under 35 U.S.C. §103(a)

Claims 11, 12, 14, 101, 103, 104, 129 and 130 were rejected under 35 U.S.C. §103(a) as being unpatentable over Brezoczky. Applicants respectfully traverse this rejection and submit that the teachings of Brezoczky do not disclose or suggest the subject matter recited in claims 11, 12, 14, 101, 103, 104, 129 and 130.

Independent Claims 11, 12 and 14

Each of independent claims 11, 12 and 14 is directed to a method of manufacturing a near-field optical head which is not disclosed or suggested by Brezoczky. For example, independent claim 11 recites the step of "forming" an optical waveguide on the second surface of the planar substrate. Independent claims 12 and 14 recite the step of "bonding" the optical waveguide on the second surface of the planar

substrate. In Brezoczky, the optical waveguide (i.e., element denoted by reference numerals 46, 49, 61, 76 in Fig. 5) is neither "formed" nor "bonded" on a surface of the planar substrate (i.e., slider 31 in Fig. 3 or 51 in Figs. 4-5). Instead, in Brezoczky the optical waveguide is connected to the planar substrate via a flexure spring suspension, as set forth above for independent claim 127.

Recognizing the foregoing deficiency in Brezoczky, the Examiner contends that the steps of "forming" and "bonding" are well known in the art of manufacturing optical heads as forms of connection or coupling techniques between elements. In view of this, the Examiner concludes that it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to connect the optical waveguide to the planar substrate in Brezoczky by "forming" or "bonding" the optical waveguide on a second surface of the substrate instead of using the flexure spring suspension. Applicants vigorously disagree with the Examiner's contention and conclusion of obviousness.

In order to support a claim rejection based upon obviousness under 35 U.S.C. §103, the Examiner must provide an evidentiary basis establishing the obviousness of each modification. The Examiner may do this by citing a reference which directly establishes this obviousness, or, the Examiner may otherwise set forth a line of reasoning consistent with

and motivated by the cited art establishing that such modifications would have been obvious. Mere speculation or conclusory allegations are simply inadequate to meet this burden. There must be some teaching, reason, suggestion, or motivation found in the prior art references to make a combination which renders an invention obvious within the meaning of 35 U.S.C §103. See, e.g., Symbol Technologies, Inc. v. Opticon, Inc., 935 F.2d 982, 989, 18 USPQ2d 1885 (Fed. Cir. 1991).

In order to set forth a prima facie case of obviousness, the Examiner must not only demonstrate that this teaching exists in the prior art, but that it would teach all limitations of the claim. Stated otherwise, in rejecting a claim as obvious under 35 U.S.C. §103, the Examiner cannot simply rely on a reference that teaches some limitations of the claim, and make mere conclusory allegations that the combination teaches others as well. In the instant case, the Examiner has not met his burden of establishing a prima facie case of obviousness with respect to the specific "forming" and "bonding" steps recited in claims 11, 12 and 14.

For example, claim 11 recites the step of "forming an optical waveguide on the second surface of the planar substrate." Claim 12 recites the step of "bonding an optical waveguide on the second surface of the planar substrate." As set forth above, in Brezoczky the optical waveguide is

connected to the planar substrate via a flexure spring suspension. Brezoczky does not teach any other form of connection between the optical waveguide and the surface of the planar substrate. In this regard, following the Examiner's conclusion of obviousness, what procedure would be followed in Brezoczky so as to "form" or "bond" the optical waveguide on the surface of the planar substrate? Even if possible to make such modifications in Brezoczky, the Examiner has not cited any reference which directly establishes the obviousness of such modification, nor has the Examiner set forth a line of reasoning consistent with and motivated by the cited art establishing that such modifications would have been obvious.

Independent Claims 101, 103, 104 and Dependent Claims 129, 130

Independent method claims 101, 103 and 104 also recite combinations of steps which are not disclosed or suggested by Brezoczky. For example, claim 101 recites a combination of steps which requires the specific manner of forming a light propagation member, a light introducing part, and a light reflection layer. Claims 103 and 104 recite the combination of steps which require the specific manner of forming a tapered hole, disposing a metal film, forming a convex surface portion, and bonding a light introducing part. The Examiner has failed to specifically address these limitations in the rejection of claims 101, 103 and 104.

Should the Examiner continue to rely on the reference to Brezoczky in any manner to reject any of claims 101, 103 and 104, applicants respectfully request that the Examiner specify the teachings in Brezoczky being relied upon and how the Examiner proposes to modify Brezoczky to arrive at the invention recited in claims 101, 103 and 104.

Claims 129 and 130 depend on and contain all of the limitations of independent claim 127 and, therefore, distinguish from Brezoczky at least in the same manner as claim 127.

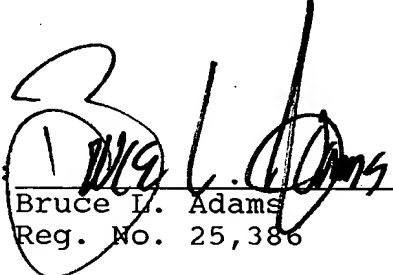
In view of the foregoing, applicants respectfully request that the rejection of claims 11, 12, 14, 101, 103, 104, 129 and 130 under 35 U.S.C. §103(a) as being unpatentable over Brezoczky be withdrawn.



In view of the foregoing amendments and discussion,
the application is believed to be in allowable form.
Accordingly, favorable reconsideration and allowance of the
claims are most respectfully requested.

Respectfully submitted,

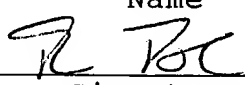
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